Training Needs of Engineer Teachers in the Palestinian Industrial Schools

Dr. Abdul fatah Shamleh

An-Najah Uational University

Prof. Raed S. Al Jammal

Introduction:

It is a well established fact that human factor determines the organization efficiency and durability. Therefore, investing in it is one of the most important functions in all types of organizations. This may appear in the form of training, socialization, ensure employee comfort and satisfaction. To achieve this end, top level managements approves budgetary sanctions and creates administrative arrangements. Consequently, human resources management department became one of the major departments in organizational structures. It consists of many units each one of them takes care of a certain portion of this function. For instance employment unit invests in getting the best possible employees, whereas other units take care of employee benefits, satisfaction, interpersonal relations, safety and security, etc. The training unit in its term carries out the planning, implementing and monitoring human resources development tasks. This implies major activities as: assessing training needs, designing plans for program execution, preparing training material, make the requirements available, ensure the availability of conducive training environment, take care of the implementation affairs and then monitors the process. (Gaible & Burns 2005: 9). Literature in this field reveals that training needs assessment is the milestone component in the function. Despite that, this issue is not taken care of as it deserves (تريسي ١٩٩٠: ٨١).

Research Problem:

A look to the training activity in Palestine results in many observations as: it is not performed on professional bases, trainees feel the need for training in many areas they were trained in, training programs are mostly carried out in response to sponsors initiatives, training material is at most a duplicated one(جامعة بيت لحم ٢٠١٠: ٧). In conclusion, training system and best training practices are absent. As a result, organizations suffer a lot. Consequently they are not that much convinced to invest in this activity. Here comes the role of academicians and practitioners to correct the training practices to make it productive and efficient as well. Since the training needs of school teachers engineers in industrial schools where not taken care of, this study answers the question: "what are the training needs of school teacher engineers in the Palestinian industrial schools". A look to the training activity for school teacher engineers reveals that it did not achieve many of its goals, as expressed by the teachers and their administration as well. On the other hand, practitioners and policy makers express their dissatisfaction from the impact of industrial education. To this purpose many conferences

and workshops were organized. This study addresses the training relevance to help in boosting this kind of education.

Significance of the Study:

Since it highlights the realistic training needs, this study is of a great importance for all stakeholders in the field of vocational education in Palestine .It is vital for MOE , industrial schools, teachers, students, and labor market as well. Consequently it enhances their overall satisfaction.

- The Ministry of Education and Industrial schools will review their polices and focus their developmental efforts on the needy are. This results in conservation of resources and having a competent staff. Furthermore, it helps in developing the training practices and prepare for a better out comes in all levels. Additionally, it helps in policy making and strategy selection for human resources development in the area of vocational education.

- Policy makers, strategists and decision makers in the various types of organizations will have a wealth of facts to assist and guide them in doing a better job. Furthermore, this study is an example that could be duplicated for creating a tailor made training practices.

- Students will benefit from the study since the outcome is a highly qualified school teacher. This will help in a better way to achieve the vision and objectives of Industrial Education in Palestine.

- Since this study stresses TNA, it will establish a professional culture of training practices. Stakeholders will feel the importance when they perceive the impact. This will boost the management to work in accordance to system not to emotions.

- Academic and training institutions will find a relevant material in this study. Furthermore, this study is a scientific contribution that adds a valuable piece of work for knowledge development. In addition to that it helps in building a model of best practices in training needs identification.

Research Questions:

This study responds to its major question which is: "what are the training needs of teacher engineers in the Palestinian industrial schools?". This question is detailed into the following minor questions:

- What are engineer school teachers training needs in relation to the various areas?
- What are the priorities of the identified training needs?
- What are the preferred ways to achieve the identified training needs?
- To what extent the provided training met the teacher engineers training needs?
- Are there any statistical significance differences in engineer school teacher training needs in relation to demographic factors such as: gender, age, qualification, specialization, experience, job title and school?

***Theoretical Framework*:**

As known, human factor is the major pillar in all types of organizations. It determines the way of managing and the level of its efficiency. Therefore taking care of this factor is one of the most critical management functions. To this purpose human recourse management department is established, to handle the tasks of getting, sustaining and developing the work force .The major component in developing is the training activity. It is defined as imparting or modifying the behavioral trends of the employee (حمدان، ٢٠٠٥: ٧). Sloman (2005:2) agrees to this definition adding that it is an instructor led and content based interventions leading to the desired changes in behavior. Behavior in this context is perceived as the demonstrated competencies while performing job relevant tasks(whiddett and Hollyford, ٢٠٠٣:٥). Training is also defined as, a systematic process that fosters the acquisition of skills, concepts, or attitudes that results in an improved match between employee characteristics and employment requirements (Milkovich & Boudreau, 1994:190). As such, it is one of the major strategies for solving organizational problem, developing performance and /or creating a competitive value. This activity is carried out to enable and prepare organizations cope with the ongoing environmental changes in technology, products, competition, consumer taste, financial markets, communication, and labor markets. If organizations doesn't induce those changes, it lacks behind others.

Training provides benefits to an organization as a whole and to its employees in specific (Palmer & Richard, 2002:148). Besides a better quality of outcomes and lower cost, other benefits may provides an opportunity to cope with wrenching changes occurring around. It also gives the company an edge over others in its field. Management becomes confident enough of employees competence. Since it helps in promoting employee satisfaction it removes obstacles and solve organization problem. In all, training makes a sound organization.

The training process comprises from many components. Logically it starts with assessing the training needs, then putting those needs in a design, preparing the environment for execution, delivering and then evaluating. A look to this cycle reveals that many parties are involved namely: the employee, employee organization, trainers, the training organization and the organization clients. The role of each and every party is prominent for the success of the training function.

Training Needs Assessment (TNA):

Definition and importance:

Experts and practitioners agree to the fact that training needs assessment is the milestone of this function. That is defined as the process of finding out the gap between what is available and what is assumed in terms of employee competence. Darweesh says it is a group of changes required in the body of employee knowledge, skills, abilities, behavior, and attitudes to a better job fit (603:١٩٨٠ ،درويش). Training needs assessment (TNA) is also defined as the process of determining what training to offer and who should be trained (Stewart ٢٠١ :341). In conclusion, TNA is the process of enhancing the employee body of competence to ensure a better way of work and result in better outputs.

Thus, training needs represent a deficit or weakness, in employee performance that can be repaired by training. They are different from time to time. It also includes many dimensions as: individual training needs, group training needs, organization training needs and environmental training needs. The identification of training needs refers to a group of activities carried out using some tools that enable reaching a list of those needs. Those activities are: to identify who are the targeted employees, to know the duties they perform, to define the available and required job specifications, to scan the equipments in use, to know the current situation,

to pinpoint the expected changes, to highlight the work obstacles and so on. As such to pinpoint the training needs we should find out the difference between the current behavior and the standard performance as a basis for that (الخطيب, ١٩٩٥: ٦٦٠). Doing that efficiently requires a professionally specialized and an able team. Even though this process (TNA) is the milestone of training activity, Hofman say that a lot of training programs are designed and executed with the absence of real assessment of the training needs(تريسي 81:1990:) .

Importance of Training Needs identification:

Cekada (2010: 33) summarizes the need for training needs assessment by stating that it is the first step in establishing training. It provides the necessary foundations and frames for plans and actions to improve performance (Gupta, 2007 20). In general this process is very important and critical for the efficiency of training programs due to the following factors:

- It is the milestone for the design and direction training activity.
- It enables focusing efforts and resources in the right place and use them in the right way.
- It provides the relevant standards and indicators of the required outcomes.
- It makes training purposive and realistic as well.
- It is required for convincing the top level management to approve the required budgets.

Who Assesses Training Needs:

Such importance necessitates the need to involve all stakeholders in this process. The employee, as major stakeholder, reveals the problems he faces during work and feels the need for training. Some of those which are not recognized by employees are observed by managers. In the other hand, colleagues, customers, and human resources management unit look to the training needs from other angles. The contributions of all parties provide a more realistic, comprehensive and integral view of those needs.

Types of Training Needs:

To ease the way of dealing with them, training needs are classified into categories on various bases. Below is a classification that better suites the training needs of school teacher engineers:

A. Induction training needs. Those are felt at the point of joining the service to acquaint the teacher with the major issues of the profession.

B. Refresher training needs .Those emerge after few years of joining the service, the aim is to update the teacher and make him aware of the new updates.
C. Institutional training need. Those relate to the philosophy, vision, mission, laws and regulations, which influence the teachers way of work.
D. Specialized training needs. Those refer to the courses taught and areas of specialization.
E. Developmental training needs. Those relate to the needs that enable the changes required to enhance the field practices and make them better.
F. Educational practices training needs. Those needs refer to the various practices in the field of teaching .They mainly concern the new policies, strategies, tools, and innovations.
G. Personal training needs. Those refer to enhancing the personal traits of the teacher.

Stewart and Brown gave two different types of training needs namely: proactive and reactive. The proactive needs assessment is a systematic process for determining and prioritizing the training programs to be developed. It includes organization analysis, task analysis and employee analysis .In the other hand, reactive training needs assessment is a problem solving process used to determine what is the necessary training to fix a specific performance problem (Stewart and Brown 2011:341) The classification of training needs may refer to the required impact of training as: personal, group or organizational training needs. It may be also classified in accordance to the sector as specialized and general training needs.

Approaches of training need Assessment:

The training literature reveals three major approaches to training needs identification: organizational analysis, job analysis, employee analysis. Organizational analysis approach focuses on philosophy, organization design, potentials, organization culture, resources and the development initiatives. In the other hand job analysis identifies the training needs out of focusing on job description, job specification, job enrichment and job enlargement issues (درة والصباغ ١٩٩٠: ٨٧). Employee analysis approach focuses on reviewing the employee characteristics and that makes him a performer. Qarioti believes that the a good approach for the identification of training needs should consider the followings: review goals, identify the tasks and programs, explore the required behavioral trends and finding out the weakness and deficiencies (القريوتي ٢٠١٠:١٧٠) . Pike and Huddlestone (2011: 1) feel that TNA model is composed of five components: constraints analysis, team tasks analysis, training environment analysis and training

options. However, a better approach for training needs identification is that which benefits from all approaches.

Prioritizing Needs:

As a result of data collection and analysis, a long list of training needs is out. It includes different types exceeds that can be covered due to budget and other work limitations. Here in comes the role of prioritization. It aims at pinpointing what needs to be addressed first. Obviously it is that which reduces the felt needs more. To this end the following analysis, should be made: business analysis, performance analysis and cause analysis (Gupta, 2007:32). The content of that analysis will include a combined judgments on the levels of urgency and importance. The importance factor refers to the level of impact when the specific need is fulfilled. In the other hand urgency relates to the time factor of achieving the need .The need may be immediate and even required for processing other activities .The very important and very urgent is a top level priority need and so on.

TNA Data:

Data collection and analysis are core activities in training needs assessment. Therefore, it is very important to take care of designing relevant data collection, analysis and methods. Methods of TNA may include: questionnaires, interviews, observations, and documentary analysis. One can think of using technology as one of the tools since it is widely used now a day's. E-mails, mobile technology, web communication tools, audio-visual plug-ins are some examples in this spectrum (Gupta, 207:63). That leads to a speedier and standardized form of data.

Data collected may be classified to two types: quantitative and qualitative. Quantitative data refers to the numerical data or any that can be quantified, while all other data are qualitative. Computer software programs as SPSS, SAS, Excel … makes it easy to provide an accurate and speed analysis of quantitative data. Results of analysis are given in form of frequency, means, percentages, correlations, standard deviation and can be presented in tables, charts, graphs or other similar techniques. Quantitative analysis involves classifying data into categories in accordance to its source, historical sequences, subject, etc. Some of the techniques used to analyze this type of data may include: posing W- questions, comparisons, logic, matching, examine reliability and validity. Combination of both statistical and theoretical result is assumed to give a clear picture on training needs.

In conclusion, needs assessment is optimized when a combination of data collection methods and analysis is used (Gupta, 2007:74). This will provide

a more clear and realistic view of the identified needs. Consequently the identified needs will be more welcomed and acceptable by the management. It is also equally important to collect data from the various stakeholders as employees, bosses, colleagues, clients, and providers. Higazi stressed the need to approach the following sources: job descriptions, managerial follow up, performance reports, technical reports, organization problem, developmental goals , employee expressions, accidents and complaints(حجازي ٢٠٠٩: ٧٢-٧٨). Buzibr has emphasized the necessity of linking training needs with the development initiatives. (بوزبر ٢٠٠٣: ٥٩) . A mix of all will result in a more realistic and rational judgment on the training needs. Ridha focused on the importance of the proper perception of indicators pointing at training needs as: low performance, authority shifts, accidents, transfers, complaints, etc (رضا، ٢٠٠٩: ٩٤) & (Swanson 1996:93). Furthermore it provides a comprehensive and clearer view of the training needs. Means and correlations will point for the priority level.

However, since training needs assessment focuses on the employee and factors effecting his performance, data collected should include: job data(as obligations and activities) , personal data (as employee personality and expectations), functional data (as employee performance) and general data as challenges facing the employee.

The employee competence is therefore the major issue of concern while assessing training needs. With reference to teacher engineers in industrial schools their competencies can be classified to the following categories:

- Personal competencies: as personality, attitude, and thinking style.
- Field competencies: as how the subject taught is implemented in the field.
- Curriculum competencies: as understanding curricula plans, teaching and learning.
- Lifelong learning competencies: as the ability to a chive professional development.
- Emotional competencies: as teacher values, attitudes, moral empathy etc.
- Research competencies: as ability to conduct research and fact finding.
- Socio-cultural competencies: as knowledge about students values and social practices
- Communication competencies as the ability to: interact, perceive students expressions, use of communication technology.

- Environmental competencies as: perceiving the emerging market needs, social responsibility.
- Legal competencies as: knowledge of educational laws and regulations.

Problem of TNA:

TNA process is faced by many challenges that jabotize its efficiency. Alma pinpointed the following problems: wrong processing, repetition of training programs, ignoring a clear identification of goals, data deficiencies, assessment mistakes, and weak perception of training outcomes (علما ٢٠٠٧: ٥٠-٥٥). Ali felt that obstacles are at most related to low profile of employees and the low image of training impact(علي ٢٠٠٧: ١٦٦). In addition to that, organizations often focus on short term needs because they are much simpler to define (Marchington and Wilkinson,٢٠٠٩: 350). In general some of the obstacles may emerge because of the personal factor as competence and seriousness. Others are process obstacles as: ignorance or doing it in a wrong way, or the bad quality of data. Other obstacles are because of the changing environment and the organization system as well.

IDHC study report (2011:10) found that there are seven gaps between industry wants and TVET outputs. They are: fragmented national system, poor collaboration, outdated training programs, limited employability of skills, limited staff preparation and lack of resources .This report emphasized the need for training VET school teachers in the above stated areas.

Previous Studies:

The researcher has reviewed the relevant research on teachers training needs on the national, Arabian and international levels. On the national level, no studies were found in the area of TNA for teacher engineers. Below is selection of some researches.

Scharts et el (2011) conducted a study titled: Meeting The Technical Assistance and Training Needs Of Iow a Non profits". The major findings included: the natural calamities posed an increased demand on new services represented in form of training needs are as networking and employing information technology .The researchers suggested building a capacity of the targeted organization to meet those needs successfully.

Hamdan(2002) studied the problems facing government industrial schools in the West Bank. He concluded that some of the identified problems are resolved throughout meeting the following training needs.

Abu Asbeh (2005) has conducted a study aimed at identifying the technical education problems in the Palestinian secondary schools .To cope with the identified problems, the researcher recommended considering the followings: to enable teachers cope with market needs ,to develop vocational development plans for teachers, develop a field training system for all parties of vocational education.

Throughout his efforts to evaluate teacher education strategy in Palestine, Hashwa (2011) has identified the following professional development needs: adult training methodologies, evaluation, developing induction programs, research and networking. He recommended that this effort should be carried out through a detailed implementation plan.

Karagiorgi and Symeon (2007) investigated the training needs of Cyprus teachers. The findings of the study pinpointed the following training needs: establish links with field improvements, enhance teacher involvement in in-service training, and coping with the recently approved policies for education reforms. It was recommended to conduct an extensive training to meet those needs.

Ali (علي2007) studies the obstacles facing training needs assessment in Yemen. He found that those obstacles are: the absence of efficient training, low level of employee profile, difficulty of measuring the training outputs, and lack of potentials to identify the training needs. He recommended: to carry out awareness campaign to enhance the image of training ,to train a team for TNA , and to make training attractive and convincing.

Abernatty(2000) conducted a study on human resources development in Florida schools. He felt the need to train school teachers using the problem solving technique, and train them in the philosophy of teaching adults.

Meanor (2001) studied "Teacher Driven Professional Development in Delware". He identified the following training needs: the philosophy of continuing learning , power sharing in schools, socio – psychological needs , changing the traditional modes of professional practices. He pointed that fulfilling those needs will result into an efficient school practices and an improved quality of graduates.

Gough(2010) have published a book titled " Technical and Vocational Education and Training" in which he highlighted the international importance of the topic discussed. This book has explored the need for

technical and vocational skills in the labor market as well as helping to solve the problem of unemployment. He concluded that teacher training is a major tool to cope with challenges facing vocational and technical education.

In conclusion, the previous studies did not cope with the title of this research. Engineer teachers training needs were not taken care of .Those studies sharpened the researcher's perception in the issue of training needs. Furthermore it helped in designing the questionnaire for this study.

Research Methodology:

The methodology of the study is illustrated by clarifying the study approach, sample, population, data collection tools, and data analysis. Below is a brief description of them.

Study approach:

This study adopted the descriptive analysis since it is the most appropriate one for this kind of studies. It implies describing the situation and provides a deeper insight into correlations and interdependencies of the training needs. Furthermore, the description raises many questions which when answered leads to successful training practices.

Data collection:

Data collection for this research considers approaching the data requires from its primary and secondary sources. The secondary sources are literature survey, previous research, and reports. The primary sources include teachers, supervisors, headmasters, directorate of vocational education and students. To collect this type of data the study utilized a variety of tools as questionnaire, interviews, and observations. Below is a brief description of those tools.

Questionnaire: Benefiting from the relevant literature, previous research and consultations, a questionnaire was specially designed as a major data collection tool for this research. For accreditation and testing, it was sent to ten academicians in the field of specialization and 15 practitioners, policy makers and head masters. Consequently some items were reframed, four items were added, and three were merged. The questionnaire in its final form contained three parts .The First : included the cover letter, personal data of the respondents (gender, age, qualification ,specialization, years of experience ,job title and school). The second part consisted of the various areas of training needs. They are: general training needs contained of six items, personal training needs consisted of eight items, educational practices training needs consisted of twenty one items, Evaluation training needs consisted of seven items, and administrative training needs consisted of thirty two items. The third part of the questionnaire contained five open

ended questions addressing the following issues: the attended training in the last three years and its efficiency, Listing four top level priority training needs, list the most sensitive problems faced at work, and any comments or observations .

A reliability test for the questionnaire was carried out using Cronbach's *alpha test*. The result was 0.923. That means a very high reliability which validates study results and makes it trustful.

Interviews : To help in questionnaire design a primary Interviews were conducted with the Directorate of vocational education, three headmasters, ten engineer teachers of industrial schools and a group of students. After the statistical results of the questionnaire are out similar interviews were carried out to help analysis.

Data Analysis

The researcher used SPSS to analyze that data collected via questionnaire. The descriptive statistical tools which were used are: frequencies, means, percentages, standard deviations, Cronbach alpha, t-Test and One Way ANOVAS Test. The qualitative data was analyzed using the following theoretical analysis techniques: logical arbitration, correlations, reason impact analysis, data validation, comparisons, relevance to the scientific models and theories.

Population:

The institutional population and sample of this study covered all industrial schools in the West Bank and the Directorate of Vocational Education (the Israeli closure does not allow approaching Gaza). Since this population is small, all teacher engineers in those schools (١٦5 teachers) represented the sample, adding to it school headmasters, their deputies and officers of the Directorate of industrial education in the West Bank. Table (١) illustrates the population of this research.

Table 1: Research population.

Industrial School	Population		Sample	
	Male	Female	Male	Female
Jenin industrial school	18	0	14	-
Selit eldaher industrial school	١٤	٢	12	2
Tulkareem industrial school	٢٤	٦	23	6
Qalqiliah industrial school	11	0	11	-
Salfeet industrial school	8	0	8	-

Nablus industrial school	28	0	26	-
Dair Dibwan industrial school	18	0	15	-
Hebron industrial school	١6	٤	16	4
Doura girls industrial school	0	11	-	11
Directorate of VET	5	0	5	-
Sub Total	142	23	122	21
Total	165		143	

The total population of this study is 165, among them 143 reported valid questioners for analysis (86.7% of the total population). Tables 2-8 show the demographic features of the sample:

Table 2: Gender

Sex	Frequency	Percent
Male	122	85.3
Female	21	14.7
Total	143	100.0

Table 3: academic qualification

Degree	Frequency	Percent
BS	113	79.0
PG Diploma	9	6.3
M.Sc.	21	14.7
Total	143	100.0

Table 4: Job title

Job title	Frequency	Percent
Directorate of VET	5	3.5
Head master and deputies	11	7.7
Teacher Engineers	127	88.8
Total	143	100.0

Table 5: Age

Age group	Frequency	Percent
Less than 25	10	7.0
25-29	33	23.1
30-39	46	32.2
40-49	41	28.7
Over 50	13	9.1

Table 6: Experience

Years of experience	Frequency	Percent
less than two years	19	13.3
(2-5 years)	26	18.2
(From 6-10 years)	39	27.3
(11-15 years)	28	19.6
(Over 15)	31	21.7
Total	143	100

Table 7: Specialization

Specialization	Frequency	Percent
Civil	4	2.8
Electrical	45	31.5
Mechanical	33	23.1
Computer	20	14.0
Communication	11	7.7
Electronics	19	13.3
Other	11	7.7
Total	143	100.0

Table 8: School

School Name	Frequency	Percent
Jenin	14	9.8
Nablus	16	11.2
Tulkarem	29	20.3
Selat Aldaher	14	9.8
Qalqilia	11	7.7
Selphite	8	5.6
Dir Dibwan	15	10.5
Hebron	20	14.0
Banat Dora	11	7.7
Ministry	5	3.5
Total	143	100.0

Tables 2 -8 reveal that only 14.7% of the sample are females which donates that females are not well represented in the industrial education; one for females against 8 for males. The medium age of the sample group is 32.6 years. This shows that they are young teachers acquiring 8.75 years of experience in industrial education. All sample members posses university qualifications and 30% among them are holders of PG diploma and M.Sc. certificates. The majority of the sample (54.6%) is specialized in electrical and mechanical engineering. That reveals imbalances in specialization; this is reflected in teaching courses which are not of their specialization. Table 1 shows that there is no equal distribution of industrial schools among the governorates. It appears that Jerusalem, Bethlehem and Jericho governorates don't have industrial schools. However, the Ministry of Education is discussing many requests for establishing industrial schools in the various parts of the country for males and females as well.

Findings:

Since the questionnaire was the major tool for data collection and SPSS was used for data analysis, and the key for answering for the questionnaire items was of five levels (very low 1, low 2, medium 3, urgent 4, very urgent 5), the results of each item were represented in a mean ranging from 1-5. Below is the key of means revealing the level of training need urgency appearing in the research findings as in table 9.

Table 9: key means reflecting the priority level and action to be taken

Mean	Meaning	Priority level	Action to be taken
1-1.8	Not urgent	Not a priority	Can be postponed
1.81-1.60	Low Urgency	Low priority	Do when possible
1.61-3.4	Mid	Medium	Do after the top and second
3.41-4.2	Urgent	Second Priority	Fulfill after the very urgent
4.21-5	Very urgent	Top level priority	To be fulfilled soon

The questionnaire classified training needs of teacher engineers in industrial schools to five categories namely: general, personal, educational, administrative, evaluation and feedback. Sample response revealing the urgency level on those areas is given in table 10.

Table 10: Areas of training needs

	Mean	Std. Deviation	Level of urgency
Educational Practices	3.96	.597	Urgent
Personal Aspects	3.92	.588	Urgent
General	3.91	.724	Urgent
Evaluation and Feedback	3.79	.917	Urgent
Administrative Needs	3.74	.763	Urgent
All	3.87		Urgent

Training needs in all areas are perceived as urgent. Though educational practices training needs head the list, but means of other areas are very close (ranging from 3.96- 3.74). Below are additional illustrations of the findings in each category. Results are arranged in accordance to the level of urgency (descending).

General Training Needs:

General training needs were viewed in six items. The level of their urgency is revealed in table 11.

Table 11: General Training Needs

	Mean	Std. Deviation	Description
Perceiving market need	4.15	1.037	Urgent
Management of industrial schools and mechanism of work	4.08	.840	Urgent
Philosophy and objectives of the industrial schools	3.92	.996	Urgent
Policy of Industrial Schooling	3.87	1.043	Urgent
Networking of Industrial Schools	3.79	.992	Urgent

Laws , regulations governing work	3.77	1.073	Urgent
All	3.93	0.997	Urgent

Table 11 shows that all needs in this sector are urgent. Perceiving market needs and managing industrial school are the top level priority training needs in this sector. Careful analysis of this finding reveals that industrial schools do not actively induce market developments. On other hand, curricula do not provide the required flexibility to enable updating market needs. The least training need in this area was training in laws and regulations governing work. However, all the means are close to each other with urgency level for all.

Personal Training Needs:

Personal training needs were viewed in eight items .The urgency level of these needs is shown in table 12.

Table 12: Personal training needs

	Mean	Std. Deviation	Description
Personality Development	4.34	.733	V. Urgent
Self-development & professional growth	4.24	.843	V. Urgent
Initiative, creativity and innovation	4.17	.825	Urgent
Professional ethics	4.15	.820	Urgent
Dealing with students	4.12	.880	Urgent
Utilization of available resources	4.02	.834	Urgent
Problem Solving	3.94	.896	Urgent
Personal appearance and behavior	3.92	.934	Urgent
All	4.11	.846	Urgent

Table 11 shows that upgrading teacher personality, professional development are very urgent training needs. Analysis and follow-up shows that this refers to the lack of pre service training in educational practices. In the other hand, the industrial schools students are at most of low level performance profile . This makes it difficult for teachers to control and manage students in the adolescence stage. Minimal efforts are observed to expose engineer teachers to latest market developments. Furthermore, libraries in schools are not well equipped to help in personal and professional development of teachers.

Educational training needs:

Educational training needs were investigated in twenty one items .The urgency level of those needs is given in table 13:

Table 13: Educational Practices

	Mean	Std. Deviation	Description
Linking theory to practice	4.32	.728	V. Urgent
Delivery of information	4.17	.822	Urgent
Consider professional changes	4.15	.855	Urgent
Adoption of technology	4.10	.937	Urgent
Attracting the students attention	4.08	.818	Urgent
Developing student thinking ability	4.07	.845	Urgent
Encourage students creativity	4.04	.918	Urgent
Interaction with students	4.01	.839	Urgent
Direct students to learning sources	3.99	.896	Urgent
Perceive work challenges	3.99	.896	Urgent
Develop presentation and discussion techniques	3.97	.911	Urgent
Offering teaching material	3.96	.887	Urgent
Readiness lesson planning	3.90	.925	Urgent
Teaching methods	3.88	.975	Urgent
Responding to questions and inquiries	3.87	.821	Urgent
Discussion Management	3.87	.898	Urgent
Ability to Train	3.83	.787	Urgent
Pinpoint learning challenges and tackle them a	3.79	.777	Urgent
Plan student professional growth	3.79	.895	Urgent
Monitoring and modifying students behavior	3.76	.815	Urgent
Ensuring the exchange of experiences among students	3.64	.875	Urgent
All	3.96	.863	Urgent

In this sector the top level priority need was linking theory with practice. That is verified since the available text books, equipments and tools to industrial schools are not that much developed as those in the market. This makes delivery of information to students depending mainly on the engineers self initiatives.

Administrative and technical training needs:

Administrative training needs were demonstrated in thirty one items. The level of such needs is illustrated in table 14.

Table 14: Administrative and Technical Training Needs.

	Mean	Std. Deviation	Description
Specialized knowledge	4.33	.798	V. Urgent
Operating machines and equipments	4.06	.918	Urgent
Motivating students	3.86	.931	Urgent
Time utilization	3.85	.966	Urgent
Taking preventive action	3.85	.847	Urgent
Leadership ability	3.84	1.092	Urgent
Managing difficult situations	3.84	.876	Urgent
Allocating work requirements	3.83	.919	Urgent
Decision making	3.83	.964	Urgent
Discuss results and utilizing them	3.81	.872	Urgent
Organize work	3.81	1.000	Urgent
Scheduling tasks	3.80	1.011	Urgent
Communication with school administration	3.80	.936	Urgent
Dealing with the school administration	3.80	.981	Urgent
Setting goals	3.79	.926	Urgent
Dealing with students problems	3.78	.888	Urgent
Estimate of problems causes and impact	3.78	.875	Urgent
Teacher language and pronunciation	3.78	.806	Urgent
Supporting planning competence to students	3.77	.998	Urgent
Effective listening	3.77	1.026	Urgent
Work procedures	3.68	.990	Urgent
Managing conflict	3.68	.976	Urgent
Control students	3.67	.991	Urgent
Communicating with students and colleagues	3.66	1.082	Urgent
Mutual relations among colleagues	3.66	.997	Urgent
Data collection and analysis	3.66	1.050	Urgent
Diagnosis of the situation	3.66	.992	Urgent
Coordination with colleagues	3.64	.952	Urgent
Drafting ,conclusions and recommendations	3.61	1.007	Urgent
Organizing and managing meetings	3.55	.886	Urgent
Perceiving body language	3.52	1.060	Urgent
Situational Reporting	3.52	.820	Urgent
Prediction ability	3.50	.978	Urgent
All	3.76	.952	Urgent

In this area, the need for specialized training is very urgent. The major reason behind that is many teachers teach courses out of their specialization. Operating machines and equipments was the other urgent priority in this sector. It is observed that

some engineers don't use all available equipments or machines. On the other hand the Ministry offers no training in this field. The only way teachers gain knowledge and skills is from user manuals, previous experience or through colleagues. This implies that there is a gap between the theory and practice. Student's interest in learning is maximized when they see the relevance of the content and how to use in practice.

Evaluation and feedback Training Needs:

The Evaluation and feedback training needs were investigated in eight items. Results of their urgency are given in table 15.

Table 15: Evaluation and feedback

	Mean	Std. Deviation	Description
Link courses together	3.90	.906	Urgent
Remedial measures	3.84	.917	Urgent
design tests	3.80	.866	Urgent
Measuring students competence	3.78	.915	Urgent
Tackle with individual differences	3.77	.940	Urgent
Practicum evaluation	3.75	.945	Urgent
Discovering students talents and competence	3.75	.968	Urgent
Perceiving measures and indicators	3.73	.880	Urgent
All	3.79	.917	Urgent

Linking courses together, taking remedial actions and designing tests were the most urgent needs in this area. This reveals that there is coordination and or a complementation gap. Courses integration is not well perceived by engineer teachers. With reference to remedial measures it shows that they face many problems while educating students. This may refer to the fact that industrial school students are of low academic profile.

Narrative identification:

Engineers teachers were asked to write a "list of four most urgent training needs". The aim of this question was to compare results with the questionnaire results and to point any other important training needs. 114, (79.7%) among the sample answered this question. Their responses were classified as appearing in table 16.

Table 16: A classified answers of the 4 most urgent training needs.

Training need	Frequency
Specialized Training	89
Training program to response to market need	45
Evaluation	42
Dealing with advanced technology	42

This identification is identical with the above listed training needs appearing in the previous tables.

Overall most urgent training needs:

The overall most urgent training needs of engineer teachers which were detected by survey are shown in table 17.

Table 17: The Most Urgent Training Needs of Engineer Teachers.

Need	Mean	Std. Deviation	Description
Developing teacher personality	4.34	.733	V. Urgent
Specialized training	4.33	.798	V. Urgent
Linking the theory to practice	4.32	.728	V. Urgent
Self-development & professional growth	4.24	.843	V. Urgent
Initiative, creativity and innovation	4.17	.825	Urgent
Delivery of information to students	4.17	.822	Urgent
Perceiving market need	4.15	1.037	Urgent
Professional ethics	4.15	.820	Urgent
Practicum	4.15	.826	Urgent
Consider professional changes	4.15	.855	Urgent
Dealing with students	4.12	.880	Urgent
Utilization of technology	4.10	.937	Urgent
Managerial of industrial schools and mechanism	4.08	.840	Urgent
attracting the students attention	4.08	.818	Urgent
Developing the ability of students thinking	4.07	.845	Urgent

Preferred Way to achieve training needs:

The sample was asked to express their view on what is the best way to achieve the identified training need. Their responses are given table 18.

Table 18: Best way to achieve the identified training need

	Workshop	Meetings and lectures	self reading material	program
No	13.5%	49.5	38.7	2.7
Yes	86.5%	50.5	61.3	97.3
Total	100.0	100.0	100.0	100.0

Results show that teacher engineers prefer the fulfillment of their training needs through conducting training programs and workshops. This gives them the chance to participate and exchange views.

Prior training:

The researcher investigated the nature of training attended by engineer school teachers. Table 19 reveals the number of training activities attended in the last three years (2009-2011)

Table 19: The number of training activities attended between 2009-2011**.**

Number of courses	No. of teachers participated in	Percent
0	45	31.5
1	44	30.8
2	17	11.9
3	18	12.6
4	6	4.2
5	7	4.9
7	2	1.4
10	3	2.1
12	1	.7
Total	143	100.0

It shows that 31.5% of the sample did not attend any training in three years, while 30.8% have attended only one program and some of them attended 10-12 trainings in the same era. This reveals that the provided training is insufficient, and was not fairly distributed.

The sample was also asked: "To what extent the attended training fulfilled your training needs". Their sample responses were:

Totally	to a large extent	Medium	Low	did not fulfill
2%	7%.	15%,	71%	5%.

This shows that engineer teachers were dissatisfied of the attended training. Follow-up revealed that the conducted training was not guided by scientific identification of training needs, and there is some deficiency in choosing teachers for training as appearing in table 19.

Problems at Work:

Engineer teachers were asked to list the most sensitive problems they face at work. The reason for this question is to find out if some of them can be tackled through training intervention. 86 (60.1%) among them answered. The responses were treated as shown in table 20:

Table 20: The most sensitive problems for engineer teachers

Problem	**Frequency**
Low level of students seriousness	71
Insufficient Budgets	39
The attention paid by MOE to teachers needs & suggestion	22
Insufficient salaries	11
The absence of a clear policy for vocational education	9

The training interventions to deal with the above problems should target: dealing with hard cases and conducting workshops to discuss policy matters of industrial education.

Correlation testing:

To answer the research question: Is there a significant difference in training needs of engineer teachers referred to gender, t- Test was used. Results are shown in table 21.

Table 21: t- Test of gender correlation to training needs**.**

Felid	Male		Female		t	df	Sig.
	Mean	Std. Deviation	Mean	Std. Deviation			
General	3.88	.730	4.07	.680	-1.097-	141	.274
Aspects of Self	3.92	.579	3.91	.651	.056	141	.955

Educational Practices	3.96	.619	3.98	.473	-.145-	140	.885
Evaluation & Feedback	3.91	.659	3.97	.450	-.376-	141	.708
Administrative Requirements	3.79	.761	4.02	.443	-1.334-	140	.184
Total Degree	3.89	.558	3.99	.454	-.763-	140	.447

The t-test analysis shows that no significant difference in engineer school teacher training needs owed to gender as all the significant difference were greater than 0.05 .

To answer the research question: Is there a significant difference in training needs of engineer teachers referred to age , qualifications , specialization , school experience ,and job title, One Way ANOVA test was used. Results are shown in table 22.

Table 22: One Way ANOVA test.

		df	Mean Square	F	Sig
Age	Between Groups	4	0.493	1.70	0.154
	Within Groups	137	0.290		
	Total	141			
Qualification	Between Groups	2	0.116	0.39	0.678
	Within Groups	139	0.298		
	Total	141			
Specialization	Between Groups	6	0.360	1.231	0.294
	Within Groups	135	0.293		
	Total	141			
Years of experience	Between Groups	4	0.402	1.375	0.246
	Within Groups	137	0.293		
	Total	141			
Job title	Between Groups	2	0.201	0.675	0.511
	Within Groups	139	0.297		
	Total	141			
School	Between Groups	8	0.312	1.038	0.411
	Within Groups	129	0.301		
	Total	137			

Results analysis in table 22 shows that there is no significant difference in engineer teachers training needs owed to age, qualification, specialization, years of experience, job title, and school.

Conclusions:

Training needs of industrial school engineer teachers are perceived as urgent on all areas, among which educational practices and personal aspects topped the list. The overall most urgent specific training needs were: developing teacher personality, specialized training, linking theory to practice, self development and professional growth. One can imagine the importance of those needs to the efficiency of industrial education. The results also show that workshops are teachers preference for fulfilling those needs. 76% of the population felt that the training they attended did not fulfill training their needs. It donates that this training suffers from severe weaknesses. The quality of students is perceived as the most serious problem facing the industrial education. This donates that the suggested training should focus on addressing this issue to enable engineer teachers generate stronger interest in this type of education besides boosting their efficiency.

Recommendations

Based on the research findings, it is recommended to:

- Fulfill the stated training needs as per priority wise, within an integral and complementary system.
- Training needs identification should be a major part in the performance evaluation formula of school teachers' engineers.
- Teachers should be encouraged to develop their professional expertise using many ways. MOE may develop training kits to this purpose or teachers may act personally in consultation with school management.
- Link industrial education practices to competences required by the labor market.
- Provide certain level of flexibility in the curricula to induce market changes.
- Industrial schools should organize workshops and professional symposiums to discuss the market needs and changes. Those developments should be considered in the ongoing curricula development.

- Developing a set of performance standards and indicators for industrial schools efficiency.
- Creating a continuous lifelong learning system of engineer teachers.
- All stakeholders including schools, universities, market organizations and business associations should cooperate to ensure better outcomes.
- Training material should be tailor made. It should also include realistic case studies and utilize the outcomes of research.
- It is vital to conduct other researches in the area to complement this study and provide a broader view of human resources development in the industrial schools. Examples of the proposed research are: evaluating the conducted training, transfer of training to field practices.

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